**In the claims**

Claims 1-15 (Canceled)

16. (Previously presented) A method of making a microsphere array comprising:

a) contacting a substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 $mm^2$, with a solution comprising a population of different particles, wherein said particles do not comprise an optical signature; and

b) applying energy to said substrate or said solution, or both, such that at least a subpopulation of said different particles randomly associate onto sites.

17. (Original) A method according to claim 16 wherein said discrete sites comprise wells.

18. (Original) A method according to claim 16 wherein said energy is in the form of agitation.

19. (Previously presented) A method according to claim 16, wherein said energy is dipping said substrate into said particles.

20. A method according to claim 19, wherein said substrate is a fiber optic bundle.

21-35 (Canceled)

36. (Currently amended) A method for decoding an array composition comprising:

a) providing an array comprising:

i) substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 $mm^2$, wherein said sites are wells; and

ii) a population of microspheres randomly distributed on said sites, wherein said population comprises at least a first and a second subpopulation each comprising a different bioactive agent and do not comprise ~~a label~~ an optical tag; and

b) [[c)]] decoding a location of said bioactive agent by correlating said bioactive agent with said location.

37. (Previously presented) The method according to claim 36, wherein said bioactive agents are nucleic acids.

38. (Previously presented) The method according to claim 37, wherein said nucleic acids are DNA.

39. (Previously presented) The method according to claim 37, wherein said nucleic acids are single stranded nucleic acids.

40. (Previously presented) The method according to claim 37, wherein said nucleic acids are double stranded nucleic acids.

41. (Previously presented) The method according to claim 36, wherein said bioactive agents are proteins.

42. (Previously presented) The method according to claim 36, wherein said substrate is a fiber optic bundle.

43. (Previously presented) The method according to claim 36, wherein said substrate is glass.

44. (Previously presented) The method according to claim 36, wherein said substrate is plastic.

45. (Currently amended) A method for decoding an array composition comprising:

a) providing an array comprising:

i) substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 $mm^2$, wherein said sites are wells; and

ii) a population of microspheres randomly distributed on said sites, wherein said population comprises at least a first and a second subpopulation each comprising a different bioactive agent; and

b) decoding a location of said bioactive agent by correlating said bioactive agent with said location, ~~The method according to claim 36, 37, 38, 39, 40, 41, 41, 43 or 44,~~ whereby said decoding comprises contacting said array with at least first and second different decoder binding ligands, whereby said first and second decoder binding ligands bind to first and second bioactive agents, respectively, to thereby identify a location of said first and second bioactive agents to thereby decode said array.

46. (Previously presented) The method according to claim 45, wherein said first and second decoder binding ligand comprise first and second different labels.

47. (Currently amended) The method according to claim 36, 37, 38 or [[38]] 39, whereby said decoding comprises contacting said array with at least a first and second different nucleic acid decoder binding ligand, whereby said first and second different nucleic acid decoder binding ligand hybridizes with said first and second bioactive agents, respectively, to thereby identify a location of said [[frist]] first and second bioactive agents to thereby decode said array.

48. (Previously presented) The method according to claim 36, 37, 38, 39, 40, 41, 42, 43 or 44, wherein each subpopulation further comprises a different identifier binding ligand.

49. (Previously presented) The method according to claim 48, whereby said decoding comprises contacting said array with at least first and second different decoder binding ligands, whereby said first and second decoder binding ligands bind to a first and second identifier binding ligand, whereby said first and second identifier binding ligand identifies said first and second bioactive agent, respectively, to thereby identify a location of said first and second bioactive agents to thereby decode said array.

50. (Previously presented) The method according to claim 49, wherein said first and second decoder binding ligands comprise first and second labels.

51. (Previously presented) The method according to claim 49, whereby said first and second different identifier binding ligands are different nucleic acids and said first and second decoder binding ligands are nucleic acids that hybridize to said first and second identifier binding ligands, respectively.

52. (Currently amended) A method for decoding an array composition comprising:

a) providing an array comprising:

i) substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 $mm^2$, wherein said sites are wells; and

ii) a population of microspheres randomly distributed on said sites, wherein said population comprises at least a first and a second subpopulation each comprising:

[[a.]] (a) a different bioactive agent; and

[[b.]] (b) a different identifier binding ligand; and

b) decoding a location of said bioactive agent by correlating said bioactive agent with said location.

53. (Previously presented) The method according to claim 52, whereby said decoding comprises contacting said array with at least first and second different decoder binding ligands, whereby said first and second decoder binding ligands bind to said first and second identifier binding ligand, whereby said first and second identifier binding ligand identifies said first and second bioactive agent, respectively, to thereby identify a location of said first and second bioactive agents to thereby decode said array.

54. (Currently amended) A method of determining the presence of a target analyte in a sample comprising:

a) contacting said sample with an array comprising:

i) substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 $mm^2$, wherein said sites are wells; and

ii) a population of microspheres randomly distributed on said sites, wherein said population comprises at least a first and a second subpopulation each comprising a different bioactive agent and do not comprise ~~a label~~ an optical tag;

b) determining the presence or absence of said target analyte; and

c) decoding a location of said bioactive agent by correlating said bioactive agent with said location.

55. (Currently amended) A method of determining the presence of a target analyte in a sample comprising:

a) contacting said sample with an array comprising:

i) substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 $mm^2$, wherein said sites are wells; and

ii) a population of microspheres randomly distributed on said sites, wherein said population comprises at least a first and a second subpopulation each comprising a different bioactive agent;

b) determining the presence or absence of said target analyte; and

c) decoding a location of said bioactive agent by correlating said bioactive agent with said location ~~The method according to claim 54, wherein~~ whereby said decoding comprises contacting said array with at least first and second different decoder binding ligands, whereby said first and second decoder binding ligands bind to first and second bioactive agents, respectively, to thereby identify a location of said first and second bioactive agents to thereby decode said array.

56. (Previously presented) The method according to claim 54, wherein each subpopulation further comprises a different identifier binding ligand.

57. (Previously presented) The method according to claim 56, whereby said decoding comprises contacting said array with at least first and second different decoder binding ligands, whereby

said first and second decoder binding ligands bind to a first and second identifier binding ligand, whereby said first and second identifier binding ligand identifies said first and second bioactive agent, respectively, to thereby identify a location of said first and second bioactive agents to thereby decode said array.

58. (Currently amended) A method of determining the presence of a target analyte in a sample comprising:

a) contacting said sample with an array comprising:

i) substrate with a surface comprising discrete sites at a density of at least 100 sites per 1 $mm^2$, wherein said sites are wells; and

ii) a population of microspheres randomly distributed on said sites, wherein said population comprises at least a first and a second subpopulation each comprising:

[[a.]] (a) a different bioactive agent; and

[[b.]] (b) a different identifier binding ligand;

b) determining the presence or absence of said target analyte; and

c) decoding a location of said bioactive agent by correlating said bioactive agent with said location.

59. (Currently amended) The method according to claim [[60]] 58, whereby said decoding comprises contacting said array with at least first and second different decoder binding ligands, whereby said first and second decoder binding ligands bind to a first and second identifier binding ligand, whereby said first and second identifier binding ligand identifies said first and second bioactive agent, respectively, to thereby identify a location of said first and second bioactive agents to thereby decode said array.

60. (New) The method according to claim 45, 46, 52, 54, 55, 58, or 59, wherein said bioactive agents are nucleic acids.

61. (New) The method according to claim 60, wherein said nucleic acids are DNA.

62. (New) The method according to claim 60, wherein said nucleic acids are single stranded nucleic acids.

63. (New) The method according to claim 60, wherein said nucleic acids are double stranded nucleic acids.

64. (New) The method according to claim 45, 46, 52, 54, 55, 58, or 59, wherein said bioactive agents are proteins.

65. (New) The method according to claim 45, 46, 52, 53, 54, 55, 56, 57, 58, or 59, wherein said substrate is a fiber optic bundle.